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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/630,836 | 07/31/2003 | Alison J. McMillan | 84801 3019 PDG | 1960 |
| 20736 | 7590 | 08/09/2005 | EXAMINER | |
| MANELLI DENISON & SELTER 2000 M STREET NW SUITE 700 WASHINGTON, DC 20036-3307 | | | PATEL, VISHAL A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3679 | |

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/630,836

Applicant(s)

MCMILLAN, ALISON J.

Examiner

Vishal Patel

Art Unit

3679

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-19 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-19 and 31-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 4-6, 8, 10, 15, 17-18 and 31-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Heshmat (US. 5,833,369).

Regarding claim 1: Heshmat discloses a seal (48) comprising a seal edge (edge of 48 that is adjacent 20), *which in use is held in close proximity in use to a relatively rotating surface (intended use)*. The edge being reinforced by creases (creases on member 48, which form corrugations on member 48 and the creases extend away from the edge) formed in a surface element (surface of 48) and extending away from the edge (the creases extend away from the edge). The seal having perforations (perforations that have a convex portion) that are provided adjacent to the seal edge (the perforations are adjacent to the edge) and to allow air leakage through the seal, the leaking air providing a lifting force on the seal (intended use, the specific environment is not claimed). The rotating surfaces rides upon an enhanced pressure created by air leakage through the perforations (the seal has a wedge film that is produced by the gas that is pumped between the seal). The respective seals are secured in alignment with the respective edges (edges of the seals 48, 49 and 68 are in alignment) presented towards that relatively rotating surface (intended use). The respective seals are secured in a recess or an aperture (the seals are secured in an aperture of a housing not showed around a shaft 20). A number of seals

Art Unit: 3679

are secured in alignment (the seals 68, 48 and 49 are secured in alignment) and a spacer is placed between adjacent seals (member 62, 66 are placed between the seals 68 and 49).

Regarding claim 2: The seal has several slots (slots in 48) to facilitate flexibility and the slots are formed between the creases.

Regarding claim 4: The seal includes a plurality of edges (edges of 48 and 49) in a seal assembly (seal assembly of Heshmat) and these edges are presented upon respective spaced seal surface elements (each elements 48 and 49 having a surface) of the seal assembly (the elements are placed upon each other or side by side of each other).

Regarding claims 5-6: The perforations are graded outwardly from the edge (this is the case since first two perforation close to the edge are small, two more perforations above the first two perforation are larger and so on). The perforations near to the edge are relatively small compared to perforations further displaced from the edge (see figure 12).

Regarding claim 8: The perforations are constricted from one side to the other to facilitate airflow to achieve the desired air pressure differential across the edge (all perforations are thorough one side of the seal to an opposite side of the seal).

Regarding claim 10: The creases in the adjacent spaced seal surface elements are in a respectively opposed relationship relative to each other (this is the case sine the crease in seal element 48 are in one direction and the creases in seal element 68 are in an opposed direction).

Regarding claim 15: The edge is substantially straight between the crease (the edge is substantially straight between two creases in the seal element 48).

Regarding claim 17: One of a stiffener fold and a stiffener element is secured to the seal to further reinforce each edge (this is the case since element 49 is secured to the seal).

Regarding claim 18: The seal having a flow deflector is provide to direct air through the seal (any of elements 60 or 62 are considered to be a deflector).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Comery (US. 2,871,038) in view of Heshmat.

Comery discloses a seal (14) comprising a seal edge (edge of 14 that is near shaft 18) to be held in close proximity in use to a relatively rotating surface (surface of rotor 18). The edge is reinforced by creases (creases in 14) extending away from the edge (the creases extend away from the edge). The creases are angular relative to the edge in order to form a ring with sails defined between respective adjacent creases (the crease are angular relative to the edge to form a ring with sails, as seen in figure 5). The edge is substantially curved between the creases. The edge is formed upon a spiral, which extends form a number of cycles to form the seal (the edge is annular and forms a ring). Comery discloses the invention substantially as claimed above but fails to disclose that a desired distribution of perforations is provided above the edge *to facilitate air pressure differential across the edge as the rotating surface rotates in relation to the edge (intended use)*. Heshmat discloses a seal to have an edge and plurality of perforations extending away from the edge (edge of 48 and slits that form strips 50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the seal of

Art Unit: 3679

Comery to have a distribution of perforations above the edge as taught by Heshmat, to provide flexibility and stiffness (column 6, lines 57-65 of Heshmat).

5. Claims 1, 11-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tseng et al (US. 5,568,931) in view of Comery (US. 2,871,038) and in further view of Heshmat (US. 5,833,369).

Tseng discloses a seal comprising a seal edge (edge of 90), the edge includes slots (94) to facilitate flexibility in the edge when held in close proximity to a rotation surface (86). The slots extend substantially perpendicular to the major axis of the edge (the slots are perpendicular to the major axis of the edge). The slots terminate in one of a keyhole and a bulbous end (the slot 94 terminates in a keyhole or a bulbous end 98). Tseng discloses the invention substantially as claimed above but fails to disclose that the seal has creases extending away from the edge. Comery discloses a seal having an edge and creases (20) extending away from the edge. It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the seal of Tseng to have creases as taught by Comery to provide rigidity and to reduce cost by using thinner strips (column 2, lines 64-66 of Comery).

Tseng and Comery disclose the invention substantially as claimed above but fails to disclose that a desired distribution of perforations is provided above the edge *to facilitate air pressure differential across the edge as the rotating surface rotates in relation to the edge (intended use)*. Heshmat discloses a seal to have an edge and plurality of perforations extending away from the edge (edge of 48 and slits that form strips 50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the seal of Tseng

Art Unit: 3679

and Comery to have a distribution of perforations above the edge as taught by Heshmat, to provide flexibility and stiffness (column 6, lines 57-65 of Heshmat).

6. Claims 1-2, 5-7, 13 and 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grondahl (US. 6,644,667) in view of Comery (US. 2,871,038).

Grondahl discloses a seal (24) having a seal edge (edge of seal near 16), the edge having a desired distribution of perforations (perforations as seen in figures 5-8) and slots (figure 8, where perforations are at the edge and the slots is near 34), the perforations are varying lengths extending from the edge (the width of seal 24 is varied column 5, lines 19-20, hence the slots would be varying lengths, where a larger width of seal 24 would have a larger slot and a smaller width would have a smaller slot) and the seal is formed upon a spiral which extends for a number of cycles to form the seal (24). The perforations are graded outwardly from the edge and the perforations near the edge have a greater population density per unit area compared to perforations further displaced from the edge (this is the case since the perforations near the area have a larger width than the perforations away from the edge, the slot or perforations are of V-shape, as seen in figures 7-8). Grondahl disclose the invention substantially as claimed above but fail to disclose that the seal has creases extending away from the edge. Comery discloses a seal having an edge and creases (20) extending away from the edge. It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the seal of Tseng to have creases as taught by Comery to provide rigidity and to reduce cost by using thinner strips (column 2, lines 64-66 of Comery).

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heshmat in view of Grondahl.

Heshmat discloses the invention substantially as claimed above but fails to disclose that the slots are of varying length. Grondahl discloses a seal to have slots and the slots are varying lengths (figures 7-8) or constant length (figure 9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the slots of Heshmat to have varying length as taught by Grondahl, since having slots with constant length or varying length is considered to be art equivalent.

Response to Arguments

8. Applicant's arguments filed 5/23/05 have been fully considered but they are not persuasive.

Applicants' argument that Heshmat does not disclose slots or a seal edge is not persuasive because Heshmat does disclose a seal edge of a seal member and having slots as noted in paragraph 2 above. Furthermore applicant argument that the edge is located around a shaft and lifting force produced by airflow is not persuasive because applicant has not claimed the environment or the shaft or the airflow.

Applicants' argument that Comery seal would not be modified by Heshmat is not persuasive because to have perforations added to Comery seal will provide flexibility and stiffness (column 6, lines 57-65 of Heshmat).

Applicants' argument that Tseng does not teach a seal but a damper 90 is not persuasive because the damper 90 of Tseng acts as a labyrinth seal and also reduces flow of fluid between to adjacent spaces.

Applicants' argument that the seal of Grondahl has the slots and perforations but function differently than applicants invention is not persuasive because as pointed above that applicant

Art Unit: 3679

has not claimed the environment and is only claiming a seal having a particular structure, which is disclosed by Grondahl.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vishal Patel whose telephone number is 571-272-7060. The examiner can normally be reached on 6:30am to 8:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached on 571-272-7087. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3679

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VP
August 4, 2005

A handwritten signature in black ink, appearing to read "Vishal Patel". The signature is stylized with a large, sweeping "V" and a cursive "Patel".

Vishal Patel
Patent Examiner
Tech. Center 3600